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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

8 December 2000

MEMORANDUM

SUBJECT: J. H. Baxter Site, Arlington, WA -- Selected Characterization Concerns and Data Highlights

FROM: René Fuentes, Hydrogeologist
Office of Environmental Assessment

TO: Kim Ogle, Project Manager
RCRA Compliance

I have prepared this memo to document and highlight a number of data and characterization topics which seem to be somewhat ignored or buried in the reports that we have received so far from the facility. The different topics included may appear somewhat disjointed, but they include many of the necessary pieces to develop a good conceptual model for the site, and they should be used as the present model unknowns which need data to verify or change our site conceptual model.

The attached copies to which I refer in the following paragraphs are only on the hard copies of this memo, since they are not easily included as electronic attachments.

Surface Water Drainages

The maps provided by the facility, and the related text discussions, have not highlighted surface water drainages except for Portage Creek and Quilceda Creek. I am attaching a copy of the 7.5 minute USGS map which covers the area, with these and other nearby surface drainage features highlighted in color (Figure 1).

An intermittent drainage from the hills to the east of the facility is shown draining into the east side of the facility. It is not clear if that drainage remains to this day, but if it does, it could spread surface contamination within the facility, or it could carry contaminants to the south.

It is also important to note that there are three drainages shown to the south which lead to Quilceda Creek. Some of these drainages can be inferred from the figures in the J. H. Baxter reports, but since the figures are black and white copies, the streams are hard to distinguish, and the lines appear to mix with surface contour lines. The color copies of the USGS map highlight these drainages in relation to the facility. In addition, if there is surface runoff from the facility, it may be easy for contamination to reach the one of these creeks and reach Quilceda Creek much sooner than just with the ground water. In addition, the facility has made a point of indicating that the ground water gradient is to the north, but has not highlighted the issue that the land

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surface slopes to the south from the facility. See attached map Figure 1.

Ground-Water PCP Data

There has been some confusion as to how many wells and how many times pentachlorophenol (PCP) has been detected at the facility monitoring wells, and at what concentrations. Jennifer MacDonald and I have prepared a composite data table which includes, by date, the detections and the locations where these detections occurred (based on the data we have seen so far). See the attached table. It would of course be better to have the facility provide a table which has been composited from all their data and certifies that it is correct and complete, but that is not available at this moment.

The attached table 1 documents that there have been numerous detections of PCP contamination in the ground water, and that these range from barely above the Safe Drinking Water Act Maximum Contaminant Limit (MCL) of 1 µg/L to 58,000 µg/L near one of the source areas which is simply shown in maps as "area of LNAPL occurrence" but where the concentration detected is not shown.

It should be noted that there are a number of values provided in different lab data sheets which have locations which do not correlate with the known site wells. These values have been entered into the table and include well BXS-6, MW-6, and MW-30. It is likely that these are duplicates, but whatever these are, and where they are from, must be documented.

There is a need for up-to-date and comprehensive data tables (ground water elevation, water quality, boring logs, well construction details, etc.), and for complete electronic data sets of the data which can be manipulated by EPA to prepare tables and figures. It is unclear whether we have all the data available for the site based on the review of documents which include subsets of the data available.

Dioxins and Furans Ground Water Quality Data

The dioxin/furan data is included in the Draft RI report dated March 10, 2000 report, but it is somewhat buried and due to the many detected values should be given more attention as a potential problem contaminant from the site. I have included copies of Tables B-4 and B-5 as attachments to this memo. I have also included some of the values in revised Figure 20 attached to this memo.

Precipitation Records

I have obtained a set of data from 1990 to 1999, and have plotted these data for our use. It should be helpful to understand the longer term hydrologic cycles which have impacted the facility. It may be helpful to do this for an even longer period, but for now this should be sufficient since the monitoring well data for the site does not exist prior to late 1980's. The precipitation table is attached as a table and graph (Figure 4).

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In addition I am including the figure from the U. S. Geological Survey Water Resources Investigations Report 96-4312, *The Ground-Water System and Ground-Water Quality in Western Snohomish County, Washington*, which shows the long term precipitation record for this general area. The average precipitation is about 46 inches per year (with records extending back to the 1920's), and the calculated evapotranspiration is about 16 to 19 inches per year. This gives an average of about 27 to 30 inches of infiltration per year for the precipitation on the site.

Altered Contaminant Maps and Cross-Sections (to Compare with those in Draft RI)
I have taken some of the maps from the March 2000 Draft Remedial Investigation Report and edited the data to better document what has been detected at the facility for PCP and Dioxin/Furans in ground water (Revised Figure 6). The reason for these maps is that there have been a number of maps provided in different plans and studies which seem to understate the site contamination.

One example of this is that PCP contamination is presented in both concentrations and coloring for LNAPL, which requires the reader to interpret those values. I have altered the maps to include actual PCP values which contrast with the otherwise minimal concentrations shown near the same locations in the facility prepared reports (particularly near monitoring well MW-1).

Another example is that in cases where there is relatively low PCP concentrations, such as the case of recent data in the facility boundary wells. These wells also have had dioxins and furans detected in those locations, but the data has been just presented in tables and not mapped (specifically monitoring locations BXS-1, SB-2, MW-2, and MW-3).

A third issue is that there have been much higher detections at the facility boundary wells than those presented in most site characterization maps (such as Figure 20 dated 2/00 in the October 27, 2000 *Response to EPA Comments on the Draft RI Report*), but these high concentrations have <u>not</u> been mapped to document the probable site releases. There should be maps from the facility which document the concentrations from different sampling events, but until that occurs the rough mapping discussed above should highlight the issue.

Maps of Known or Suspected Source Areas
I am including these maps to make it easier to locate known source areas than having to look through a number of reports to find a map. Minor alterations and highlighting have been made to these maps. The maps are HartCrowser Figure 2 dated 6/99 from the Draft Work Plan for the RI, and also an older Facility Map from Woodward-Clyde Consultants labeled Figure 2, Project No. 90C0456A, which has some older building locations, and the South Woodwaste Landfill shown on it.

Issues which are raised by these maps include:
Is there a separate North Woodwaste Landfill? What is the other J. H. Baxter facility mentioned in other reports and is that related to this landfill name? What was disposed of at that landfill?

Has it been monitored?
Which of those source areas have been documented cleaned and the original cause of the source removed?
Have the underground piping been tested and the areas checked for more sources related to the production process rather than just the documented surface spills?

Need for Site Conceptual Model

There needs to be a conceptual model of the site developed, and used to develop additional data needs, which is dynamic and which is revised as new data is obtained. The issue of a conceptual model has been discussed in detail in several EPA guidances, and I am attaching a few pages of a write up on development of a conceptual model from the 1993 OSWER Directive 9234.2-25: "*Guidance for Evaluating Technical Impracticability of Ground-Water Restoration*", which I consider a good summary of what is needed. These pages include the write-up on the "Development and purpose of the Site Conceptual Model", and also include the figures which were used in that document. The document states in page 13 "The site conceptual model synthesizes data acquired from historical research, site characterization, and remediation system operation."

Attachments